A.A.A.S. BULLETIN

VOL. 4 JANUARY, 1945 No. 1

Published monthly by the American Association for the Advancement of Science. Office of Publication, North Queen St. and McGovern Ave., Lancaster, Pa. Editorial and Business Office, Smithsonian Institution Building, Washington 25, D. C., to which office all communications should be addressed.

Edited by F. R. Moulton and Sam Woodley.

Single copy, 10 cents; annual subscription, $1.00.

Entered as second-class matter at Lancaster, Pa., March 24, 1942, under the Act of August 24, 1912.

A Middle Class in Science

It is all the fashion to speak of progress in science, of its expanding frontiers, its rapid advancement and new developments. At the turn of the year it is customary to review with pride and hint with hope at the great achievements of the preceding year. The emphasis and the interest falls feverishly upon the new.

The chemist is buoyed up by the revelation that 1944 marked the successful synthesis of quinine, the quest upon which eighteen year old William Perkin was embarked when in 1856 he stumbled upon mauve purple, the first of the aniline dyes. The physicist takes pride in the triumphs of echolocation by means of radar, even though the details remain shrouded in military secrecy. And where is the physician whose equanimity has not been enhanced by last year's rapid progress in chemotherapy, paced by penicillin, plasma and sulfa drugs?

In every splinter of the great trunk of science there is to be found some novel progression of knowledge from which the specialist can draw new faith and feed fresh hopes. The sanitarian rejoices over DDT, the potent insecticide; the aerodynamic engineer savors the potentialities of jet propulsion; the nutritionist gleefully adds newly discovered and numbered vitamins, B_{10} and B_{11}, for example, to his charts. Wherever men of science foregather, whether in formal meeting or across the table in the faculty club, the shop talk revolves about the new: new facts discovered, virgin hypotheses conceived, original papers written, novel interpretations ferreted out and speculations as green as grass in the springtime. Such conversation, and the attitude it reflects, is all to the good, both for science and humanity. A man's reputation as a scientist has always rested upon the new nuggets of knowledge that he has pried out of the limitless vein of man's ignorance of the subtle ways of Nature.

But science, now lusty as theology is musty, is beginning to pay a price for honoring new knowledge so far above old. The neglect of the history of science—especially on the part of the most gifted and vigorous leaders in the scientific world—has begun to exact a toll transcending academic considerations. In favoring the new over the old, in keeping a Rotarian eye glued solidly on the future "with never a backward glance," in glossing over the hard-won steps through which present-day refinements in laboratory research have evolved, a serious hiatus has occurred between the scientist and the layman.

There is no middle class in science: the choice lies between the expert and the ignoramus. The middle ground, where science might be treated as a cultural subject, is practically untenanted. Even the 16,000 teachers of natural science in secondary schools cannot be said to hold the gap between science's painful past and hopeful future. A recent large-scale discussion at one of the foremost teacher-training institutions in the United States disclosed a most abysmal ignorance, even among teachers of natural science, as to the nature of science, scientific thinking and scientific method. Many teachers neither saw nor made any distinction between science and technology! It is the fear spun from such ignorance that gives voice and ear to specious proposals for declaring a "moratorium" on scientific research.

In science, as in politics, society pays a high price for forgetting the lessons of yesterday in its concern for tomorrow. One among many examples which might be adduced, should suffice to illuminate the folly of failing to provide a middle class in science.

No area of scientific endeavor has delivered more spectacular advances in the past decade than medicine. No single medicinal agent has received more day-to-day publicity than blood plasma. Nowhere has more fundamental research on this life-saving element been conducted

than in Boston, at laboratories of the Harvard Medical School. Citizens and scientists of Boston might justly share the pride reflected upon their metropolis by nationwide newspaper reports of achievements in medicine and surgery made possible with plasma and its various fractions: serum albumin, fibrin film, fibrin foam, etc.

But Bostonians must display an alarmingly different reaction to the report of the Strayer School Survey published in the *Boston Daily Globe* in November. This report disclosed that health education in Boston schools was at a low level and that school health practices left much to be desired. Children in Boston schools studied the value of fresh air, but in one school there were double windows still on in May and in another the windows could not be opened because of broken window cords and chains. Children had their eyes tested for vision, but in some old school buildings the lighting, natural and artificial, was woefully inadequate. Children studied nutrition, but the lunchroom menus were lush with carbohydrates. Concerning the areas of health education, physical education and recreation, the Strayer report laments: "These three areas, once so bravely pioneered, have not been maintained at the high level that might be expected." If more attention had been devoted to developing an alert middle class in science, such brave expectations need not have been disappointed.

The Boston survey is significant, says The Journal of the American Medical Association, because in place of Boston one might put the name of any of a large number of American cities. Still it is not only in school systems that the application of available medical knowledge to the prevention and cure of disease and untimely death has grievously lagged. Industrial health education, for instance, is still in swaddling clothes. Death and disease rates among the nonwhite population of the United States remain a doleful reflection in part of ignorance about the simplest methods of health care. The Surgeon General of the U. S. Public Health Service is authority for the statement that the average life span in the United States could be increased by ten years if all presently available health knowledge were adequately utilized—without a single new discovery.

New discoveries in science are not to be decried or discouraged. They are life blood. A new world has been opened by the electron microscope. Nuclear physics and high polymer chemistry are girding for fresh triumphs. The application of technologies born of science is bound to bring a shinier, more convenient environment. With the increasing draft of brilliant scientists into industrial laboratories, where the premium is naturally enough upon new discoveries and original applications, a special responsibility now falls upon the science departments of universities, colleges and secondary schools.

Though new perhaps to science, the responsibility is one that traditionally belongs to institutions of higher learning. It is the tradition of preserving the funded wisdom of the ages. What they have already done for the "humanities," the universities must now do for the "old knowledge"—the classic knowledge—of science. An informed middle class in science will evolve through the study of science as a "cultural subject." Thus will its value be maintained and its time-worn truths continue to be utilized. The exact pattern of this kind of liberal education in science cannot be blue-printed here. It is being formulated in the ferment of many minds, through such diverse methods as interdepartmental teaching and research projects, new courses in the history of science, conferences in science and philosophy, organization of science clubs among young people, and the like.

A classical training in science will help to remove the rosier Rotarianism from the subconscious mental set of the scientists of the future. Appreciation of new discoveries will be enhanced by more attention to the old masters. Every reworking of the material of such a master as Leonardo da Vinci, for example, brings up new material for study. When a tradition of scholarship—in contrast to research—emerges in science, there will be a middle class which understands its responsibility for the constant maintenance of the application of scientific knowledge—as in health education—to the needs of society.

—Justus J. Schifferes.

Six Patriarchs of the Association

Within the past two years five members of the Association have died whose memberships had been continuous for more than 64 years, and one still survives whose membership has been continuous since August, 1875, or for nearly 70 years. Their membership extended over about two-thirds of the interval since the Association was established and over a much greater fraction of the advancement of American science.

In the order of their birth those honored members of the Association who have recently died are: Herman L. Fairchild, who was born in Montrose, Pa., on April 29, 1850, and died on

November 29, 1943; Simon H. Gage, who was born in Maryland, N. Y., on May 20, 1851, and died on October 20, 1944; John Henry Kellogg, who was born in Tyrone, Mich., on February 26, 1852, and died on May 4, 1943; Edward Bausch, who was born in Rochester, N. Y., on September 26, 1854, and died on July 30, 1944; and William Fellowes Morgan, who was born in Staten Island, N. Y., on September 24, 1860, and died on May 3, 1943. The surviving member is Alfred Springer, who was born in Cincinnati, Ohio, on February 12, 1854, and is now almost ninety-one years of age.

Dr. Kellogg and Dr. Springer were elected members of the Association in 1875 at its twenty-fifth meeting which was held in Detroit, Mich., from Wednesday, August 11, to Tuesday, August 17, inclusive. Dr. Kellogg was a physician in Michigan and Founder and Director of the Battle Creek Sanitarium. Dr. Springer, a chemist and physicist, received the Ph.D. degree from Heidelberg, Germany, in 1872, and the John Scott medal of the Franklin Institute in 1891. He was secretary of the "Subsection on Chemistry" of the Association in 1881, secretary of the Section on Chemistry in 1882, and vice president for the Section on Chemistry in 1892.

In 1875 when Doctors Kellogg and Springer were elected members of the Association, its total membership was 807. At the Detroit meeting at which they were elected 165 members were registered as attending and 136 papers were presented. The program of the meeting was organized in two parts, Part I being on Mathematics, Physics, and Chemistry, and Part II on Natural History. The citizens of Detroit placed the Opera House at the disposal of the Association for holding the general sessions of the meeting and the Common Council Chamber of City Hall for the Subsection on Chemistry.

Dr. Bausch was elected a member of the Association in 1877 at a meeting held in Nashville, Tenn., from Wednesday, August 29 to September 3, inclusive. In spite of fears of yellow fever which was prevalent in the South the registration was 173 and 78 papers were presented. The local committee with truly southern hospitality arranged an extraordinary number of excursions to places of scientific and historic interest and arranged brilliant social affairs. A special train was provided for an excursion to Chattanooga where the members of the Association were entertained for more than a day, after which a party under the guidance of General Wilder made a trip of a week through the geologically interesting mountains of North Carolina, while another party took an excursion of four days to Birmingham, Ala. The climax was an excursion about three weeks in duration extending as far south as San Antonio, Texas, "without care or expense" to those participating in it. "From this excursion the party returned loaded with specimens illustrative of the natural history of the region passed over, surprised at the natural resources of the great state of Texas, and highly pleased with the kind reception everywhere extended." It may be that it would be advantageous for the Association to return to more leisurely meetings extending over the week-end, such as the British Association still held up to the beginning of the war.

Dr. Morgan was elected a member of the Association in 1878 at its twenty-seventh meeting which was held in St. Louis, Mo., beginning on August 21. The following quotation from the history of the meeting, written by the Permanent Secretary, Frederick W. Putnam, shows why the registration was only 134 and is a reminder of the great progress that has been made in the control of infectious diseases. "Owing to the unprecedented heat from which the city had suffered, and to the epidemic of the yellow fever which was increasing to an alarming extent in the southern states at the time of the meeting, the attendance of members from the north and east was much lessened by the fear that the epidemic would extend up the river to St. Louis; and this fear was increased by several erroneous and sensational reports that the fever had broken out in the city during the week preceding the meeting."

Of the seven members' names that were listed in the beginning there remain only Dr. Fairchild and Dr. Gage, both of whom were elected members of the Association in 1879 at the meeting held in Saratoga Springs, N. Y. At this meeting the membership of the Association first passed the thousand mark with a total of 1,030, including 153 members whose dues were in arrears.

Dr. Herman L. Fairchild was vice president for the Section on Geology and Geography in 1898, member of the committee that drew up the constitution which was adopted in 1919, and a member of the Executive Committee of the Council from 1921 to 1927, inclusive. Dr. S. H. Gage was a vice president of the Association three times between his election as a member in 1879 and 1900, first for the Section on Microscopy in 1885, then for the Section on Biology in 1892, and finally for its successor Section on Zoology in 1899. The American Society of Zoologists was organized in 1903.

These reminders of a past that is not far distant as measured in human lives but in quite another period as measured by human understanding of Nature may be terminated by a quotation from the presidential address of Professor O. C. Marsh which was delivered in 1879 at the meeting at which Drs. Fairchild and Gage were elected members of the Association.

I have endeavored to define clearly the different periods in the history of Palaeontology. If I may venture, in conclusion, to characterize the present period in all departments of science, its main feature would be a *belief in universal laws*. The reign of Law, first recognized in the physical world, has now been extended to Life, as well. In return, Life has given to inanimate nature the key to her profounder mysteries—Evolution, which embraces the universe.

Medical Education at Present

Dr. Willard C. Rappleye, Chairman, Executive Council, Association of American Medical Colleges; Dean, Faculty of Medicine, Columbia University, has published an authoritative discussion of "Medical Education after Three Years of War" in the November issue of The Connecticut State Medical Journal. Many of his statements are of such general interest that they will be briefly summarized here.

Of the 77 approved medical schools in the United States, 69 provide four years of training and 8 only the first two years. Just previous to the war these schools graduated an average of approximately 4,900 doctors per year, and Canadian medical schools about 60. In addition, unapproved medical schools added about 230 licensed physicians and American graduates of foreign medical schools averaged 400 to 500 per year. Taking into account the death rate, these figures indicate an increase to the profession of about 2,000 doctors per year.

Regarding the adequacy of physicians, Dr. Rappleye wrote: "The ratio of physicians in the United States to the population previous to the present war was approximately twice that of such countries as England, Denmark, Switzerland and an even higher proportion than existed in Germany, France and the Scandinavian countries, all of which had reasonably adequate medical services. It seems entirely reasonable to state that the number of physicians available in this country is entirely adequate for the medical needs of peace time and that there is no justification for any substantial increase in the output of the medical schools."

During the war there has been a greatly accelerated program of medical education which promises to graduate in the period 1942–48 about 10,000 more doctors than normal. The conditions do not justify recent fears that there will be a scarcity of doctors in the years immediately following the war or that more facilities are required "to meet an alleged future shortage of doctors." ". . . it would be unfortunate if the standards of medical education in the country were to be lowered or that new medical schools be created when there is no evidence that thoroughly qualified individuals have not normally been able to get into medical schools."

"Those of us responsible for the administration of the medical schools are not disquieted by the possible shortage of medical students in 1945 and thereafter. Any favorable development in the plans for even partial demobilization of the Army during the next year will produce not a shortage of medical students but an excess number of applicants. In view of the extra production during the current period of about 10,000 doctors more than normal and in view of the well founded predictions of Selective Service Headquarters that under existing programs the ratio of doctors to the population in 1949 will be about one physician to 733 individuals, there is no cause for anxiety. This Association and the medical schools continue to support the attitude of Selective Service, the War Department, the Navy Department, the Inter-Agency Deferment Committee and the White House on the question of manpower as related to medicine. We are interested, as the country should be, not in training more but in preparing better doctors."

There have been two respects in which medical talent has not been used efficiently in this country. Under existing conditions a graduate of a medical school after completing his hospital training normally spends from five to ten years in developing a medical practice commensurate with his skill. Another loss results from poor distribution of physicians in times of peace, some places having too many and others too few to serve the public. As Dr. Rappleye suggests, one remedy is to provide hospital centers in which varied skills will be available to those requiring medical attention and where competent young doctors may work effectively during the years when they can make their maximum contribution to public welfare.

A release from the Office of the Surgeon General presents statistics which make clear the reason for the present shortage of doctors for civilian practice, a condition that probably has aroused the fears that there may not be enough physicians in the immediate postwar period. At the beginning of the first world war the total personnel of the Army Medical Department was about 8,000; now it exceeds 680,000. Of this great number, about 45,000 are in the Medical Corps, 15,000 in the Dental Corps, 2,000 in the Veterinary Corps, 2,500 in the Sanitary Corps, 15,000 in the Administrative Corps, 59 in the

Pharmacy Corps, and 40,000 in the Army Nurses Corps. For the purposes of the present discussion, the 60,000 men in the Medical Corps and the Dental Corps are of particular interest. In the corresponding services in the Navy there are something like one-third as many medical men. It follows that the war has drawn from civilian practice into our armed services about one-third of the approximately 170,000 licensed physicians in the United States in 1941.

Public health obviously depends upon the knowledge and attitudes of the general public as well as upon doctors and nurses. The dissemination of information about sanitation, protection against infectious diseases, first aid in case of injuries, diet, hospitalization and other matters pertaining to health has been enormous during the war period. In the Army Medical Department there are 560,000 enlisted men who are receiving practical training in sanitation and methods of caring for patients and all the elementary skills required by the Army to protect the health and lives of men in its combat units. Most of the lessons learned in this training and from the accompanying experiences will be carried into every city and hamlet in this country, and to an appreciable extent will raise the level of understanding of public health problems.

The February Scientific Monthly

Professor Emeritus A. G. Keller of Yale heads the list of contributors to this issue. In his essay on the transplantation of democracy the wisdom of a lifetime's attention to the science of society shines throughout the text and flashes occasionally in memorable phrases.

Next in line will probably be Prof. H. L. Dorwart of Washington and Jefferson College, a young teacher whose enthusiasm for mathematics is, we hope, contagious. Some readers of his article may discover that mathematics is more fun than crossword puzzles—and much more useful.

By request Prof. J. J. Davis of Purdue is trying something new. He will describe the origin, purpose, and performance of the National Pest Control Association, of which he is regarded as the godfather, or "guidefather." We intend his article to be the first of a series describing those semiprofessional and trade associations whose effectiveness is partly dependent on the progress of science.

Heading the illustrated section will be that rugged veteran Dr. E. W. Gudger, the Ripley of *The Scientific Monthly*. Believe it or not, cats do go afishing, and in curious ways. But we will not blunt the reader's curiosity by revealing the contents of "Feline Fishermen." The family will want to read it, too.

For scientists only there is a long article on scientists' postwar problems, by Dr. Harry Grundfest. Dr. Grundfest outlines the numerous problems that are likely to arise from the dislocations of war and recommends solutions that involve increased expenditure of Government funds for science and the unionization of scientists with other professional groups. Those scientists who regard themselves as free and successful individualists should not ignore Dr. Grundfest's article but should read it carefully, however pernicious and shocking it may seem to them. Power does lie in organization, which may lead either toward freedom or enslavement of science. To show what may happen when bureaucracy, however well-intentioned, overshadows science, we reprint "The Autonomy of Science" by Prof. M. Polanyi of Manchester, who found in England the freedom denied to him on the Continent.

More than one excursion may be taken in the February *Monthly*. With Prof. W. T. Shaw of Fresno State College we may journey across central California from the sea coast to the Nevada line, up hill and down, through pleasant valleys, farms, forests, frigid mountain passes, and deserts, studying with him the cross-sectional wild life of the State as it is constituted by adaptation to the various environments encountered along the way. Dr. J. E. Collier, of Missouri, takes us into the interior of Australia and explains the dependence of the great grazing industry of that relatively dry country on vast artesian basins that have been tapped to provide water for cattle and sheep. Prof. W. T. Skilling, of San Diego, has in store for us an armchair trip through our "island universe" and other galaxies.

Mr. T. A. Boyd, Research Division of General Motors in Detroit, has agreed to write for the February *Monthly* a short biography of his chief and colleague, Dr. C. F. Kettering, the new President of the A.A.A.S.—F.L.C.

Amateur Astronomical Societies

Sky and Telescope, an excellent monthly journal for amateur astronomers, published in its January issue a list of 44 amateur astronomical societies in the United States which hold regular meetings. They are distributed from Portland, Maine, to Portland, Oregon, and frum Duluth, on the shores of Lake Superior, to Miami, Florida. Such widespreal interest in a subject having so

few practical applications, and offering no rewards except the intellectual satisfactions the amateur in science receives, naturally stimulates reflections.

Astronomy is reputed to be the oldest science, though the beginnings of many sciences are unknown because they lie beyond the farthest horizons of history. It is certain, however, that eclipses of the moon were correctly predicted several centuries before our era, and it is equally certain that those predictions must have been based on several centuries of carefully recorded and preserved observations. It is likely that they were made by several different peoples and that the records were transmitted from one country to another. At the time when the apparent motions of the planets among the stars were first explained by cycles and epicycles no other science had been so highly developed.

Throughout its history, as well as in its origin, astronomy was a subject of great interest to many peoples. It was cultivated by the Babylonians and the Persians; it influenced the Egyptians in orienting their pyramids; and it flourished among the Arabs during the Dark Ages. Copernicus spent his life in establishing such an apparently impractical fact as that the sun is the center of the planetary system, with the practical result that his theory upset the thinking of theologians and the general public for several generations.

In ancient days all scientists were amateurs in the sense that they pursued their investigations and speculations solely for the intellectual satisfaction they got from their work, and in that sense the greatest scientists always have been amateurs and are amateurs today. Astronomers have always been amateurs, and the members of the 44 amateur astronomical societies listed in *Sky and Telescope* are kindred spirits of the Assyrians and the Chaldeans and the Psalmist and all the watchers of the stars throughout the ages. There are hundreds of other amateur scientific societies in our country of such cultural importance that the Association should make a survey of them and a permanent record of their existence, purposes, and memberships. In fact, in 1940 a survey was made under the auspices of the American Philosophical Society of science clubs and amateur scientific societies in Philadelphia. This investigation found 287 such organizations with a total membership of 32,000. About 40 of these clubs and societies were interested in such strictly scientific subjects as astronomy, botany, chemistry, and entomology, and the remainder more interested in applied science.

The National Roster

The National Roster of Scientific and Specialized Personnel is the agency of Government to which has been delegated the responsibility of securing the most effective utilization of the nation's highly trained specialized personnel. Originally established in June, 1940, as a joint project under the National Resources Planning Board and the U. S. Civil Service Commission, the Roster was transferred to the War Manpower Commission when that agency was created by Executive Order in April, 1942. It is now a division in the Bureau of Placement of the War Manpower Commission.

Two purposes of equal importance have always predominated in the Roster. First, has been the registration, recruitment and making available for placement purposes of skilled professional and scientific individuals for war work. Second, has been the conservation of this reservoir of human resources.

Approximately 450,000 individuals are now registered with the Roster. Specifically, the total registration in the Roster on October, 1944, was 444,848, of whom 424,938 were men and 19,880 were women. The registration in the engineering sciences was 202,438; in the physical sciences, 110,240; in management and administration, 60,412; in the social sciences, 30,581; in the biological and agricultural sciences, 26,032; in architecture and planning, 9,340; and in languages, 5,675.

Complete information concerning the education, training and experience records of these individuals is maintained by the Roster. This information is coded, classified, and reduced to punch cards in accordance with a numerical code. By the use of its electrical punch card procedure it is possible for the Roster quickly to assemble the records of specialists that may be needed in any field, whether it be on a qualification or functional basis.

War industries, war industrial establishments, Government agencies and the Army and the Navy have called upon the Roster for qualified and available personnel with specialized qualifications. At this writing, the Roster has placed approximately 50,000 of its registrants. Thousands have been granted commissions in the armed forces, while other Government war agencies have utilized the Roster's resources for the purpose of securing specialized personnel for secret and other projects.

From the very beginning the Roster has acted as a consultant to the Selective Service System

and has provided advice with respect to the draft classification of approximately 35,000 of its registrants. When the college student deferment program was in effect, all requests from the college to the local boards were processed through the Roster. The Roster has also provided advice to the Office of the Adjutant General, the War Department, and to the Bureau of Naval Personnel, Navy Department, concerning the special qualifications of Roster registrants inducted into the armed forces. This information has proved valuable in connection with the decisions made by the armed forces concerning the military assignments of these individuals.

Even now a majority of Roster referrals are being made to war industrial establishments and to the armed forces. During demobilization and the postwar period, professionally and scientifically qualified individuals will have an excellent opportunity to call upon the Roster for suitable job openings. At the same time employers seeking professional and scientific personnel will be able to submit these requests directly to the Roster. Here the job order and the available applicant can be matched up.

The Roster registration is not yet complete for most fields. If those not registered will send a card, stating name, address, general qualifications and field of specialization the necessary materials for registration will be promptly supplied. The address of the Roster is 1066 U Street, N.W., Washington 25, D. C. The Director of the Roster is Dr. George A. Works.

The Council of the A.A.A.S. voted at Cleveland to have a committee of five appointed representing the Association to acquaint it more fully with the Roster and to advise the Roster how it may better serve the purposes of the Association.—EDWARD E. KNOTT.

The Georgia Academy of Science

At the suggestion and on the invitation of a committee of the Scientific Society of the University of Georgia, a group of Georgia scientists met at Athens on March 25, 1922, for the purpose of organizing an Academy of Science. Prof. R. P. Stephens was elected temporary chairman and Prof. Henry Fox was elected temporary secretary.

There developed quite differences of opinion as to the nature of the proposed organization, whether it was to be one with a limited membership or a much larger one open to all who might be interested in the scientific development of Georgia. It was finally agreed that for the present, at least, the best results would be secured by limiting the membership to those who had already made some contribution to science. A committee was appointed to draft a constitution and bylaws and to make arrangements for the first annual meeting of the Academy.

This executive committee, consisting of the temporary officers, together with Professors Boggs, Branch, Higgins, McHatton, and Nelms, prepared a constitution and bylaws and submitted it by mail to all those who were present at the organization meeting.

Of the first fifteen meetings of the Academy, five were held in Athens, eight in Atlanta or Decatur, and one each in Macon and Experiment. The University of Georgia has been host five times, Georgia "Tech" three times, Emory three times, Agnes Scott two times, Wesleyan once and Experiment once. It was probably the idea of some members in the beginning that the Academy should meet in different parts of the state in order that we (the state and the Academy) might become better acquainted. This idea has seemingly played no part in the arrangements for the meetings.

After the organization meeting which was held in March, 1922, the first five annual meetings were held in November or December. But instead of having the 6th annual meeting in December, 1927, the Executive Committee decided to try out the late winter and held that meeting February 2, 1928. The time after Christmas seemed to prove more satisfactory, and all subsequent meetings have been held approximately in the period from February to April.

At the first annual meeting in 1922, the guest speaker for the occasion was Dr. C. G. Abbot of the Smithsonian Institution, who delivered an address on "The Heat of the Sun and Other Stars." Some of the other outside speakers have been Dr. F. Allison of Auburn, Dr. Charles H. Herty, Dr. K. K. Darrow of the Bell Telephone Company, Dr. A. W. Rowe of the Evans Memorial Hospital of Boston, Dr. Wm. L. Moss, Dr. C. C. Harrold, and when we had our joint meeting with the Georgia Section of the American Chemical Society, together with the physicists of the Southeast, we had both Dr. A. H. Compton and Dr. Alexander Silverman. We have also had Dr. H. B. Ward.

In the beginning the Academy adopted the policy of rotation in office except in the case of the Secretary-Treasurer, the active executive officer, who is elected for a three-year term. The first secretary-treasurer was Prof. Henry Fox of Mercer who served until September 1925; Dr. C. R. Fountain filled out his unexpired term. A great deal of the early success of the Academy was due to the energy and enthusiasm of Dr. Fox. In November 1925, Dr. David F. Barrow was elected secretary-treasurer for a period of three years, and in February 1929, he was succeeded by Prof. G. H. Boyd who served for twelve years. Dr. Boyd proved to be an ideal man for the position and the Academy prospered under his administration. In 1941, Dr. A. S. Edwards was elected secretary-treasurer and has continued until the present time. The Historian is Dr. R. P. Stephens who held this office until April, 1944. The new Historian is Dr. R. C. Rhodes, of Emory University.

One of the questions most debated at the organization meeting was the question of limited or of open membership, and it has been discussed much since that time. Chancellor Barrow remarked that we could put on a limit and gradually raise it as we saw others who ought to be members. This has largely been the policy of the organization. The first limit was fifty. This was later raised to seventy; to eighty-five; and then to one hundred five. Two years ago membership was opened to "Residents of Georgia who are engaged in scientific work, or who are interested in the development of science." At the present time special efforts are being made to increase the membership of the Academy.

To the present time the Georgia Academy of Science has published only its annual program which contains abstracts of the papers presented at the meeting. In addition the Academy now publishes a Bulletin twice a year. Efforts have been made to arrange for other publications during the year.

An annual prize for the best essay is awarded by the Academy and is given by the Phipps & Bird Company of Richmond, Va.

Small amounts are offered annually to members for research.

The Academy has attempted to develop interest in application of science to industry and to interest industrialists in the Academy. The meeting this year will bring together members of the Academy and industrialists to discuss the development of valuable research for Georgia and for the South. Meetings will be held during the war period if it appears that some contribution can be made to the war effort and to the development of science in the state. A number of the members of the Academy are already in the service.

Members, fellows, honorary members, and patrons. The initiation fee is $3.00; annual dues are $2.00. The business of the Academy is conducted by the fellows.

Until the organization of the Academy, there had been very few contacts between scientists in Georgia outside of their own institutions. The national societies usually met at such distances that the Georgian could seldom attend, and meet scientists from distant institutions, and there was little incentive for him to meet the members of the same department in sister institutions. The organization of the Academy improved this situation. It is true that other agencies participated in this formation of good fellowship. The Southeastern Section of the Mathematical Association of America has done a great work, as also has the Georgia Chapter of the American Chemical Society. But none has been so effective as the Georgia Academy's meetings where, for instance, the chemist not only meets other chemists, but also physicists and biologists.

The Library of the Academy has been organized in connection with The General Library of The University of Georgia. The University Library handles all exchanges and loans. Academy material is thus permanently preserved and easily available.—A. S. Edwards, Secretary-Treasurer.

Membership in the Association

Eligibility for Membership

Membership in the Association is open to all persons engaged in scientific work, whether in the fields of the natural or the social sciences; to all amateur scientists, whatever their special interests; and to all who desire to follow the advances of science and its effects upon civilization. Members having made substantial contributions to the advancement of science are eligible for election as fellows.

Dues and Publications

Membership dues are $5 per year, including subscriptions for the monthly A.A.A.S. Bulletin and either the weekly journal *Science,* now in its 101st volume, or *The Scientific Monthly,* now in its 60th volume. *Science* is a journal for professional scientists; the *Monthly* is a nontechnical journal for the intelligent public. The Association also publishes technical symposia and nontechnical books on science that are available for members at prices substantially below those to the public.

Organization and Meetings

The Association was founded in 1848, with an initial membership of 461. Papers in its early programs were classified as either natural philosophy or natural history. Now its work is organized under 16 sections and 189 associated societies having a total membership of over 500,000. Its annual meetings are the greatest regular gatherings of scientists in the world.

Nominations and Applications for Membership

Members may submit nominations for membership at any time, and persons desiring to become members can obtain membership application forms from the Office of the Permanent Secretary, the Smithsonian Institution Building, Washington 25, D. C.

Changes of Address

New addresses for the Association's record and for mailing the journals *Science* and *The Scientific Monthly,* as well as the A.A.A.S. Bulletin, should be in the Office of the Permanent Secretary, Washington 25, D. C., at least two weeks in advance of the date when the change is to become effective.

Officers of the Association

President, Charles F. Kettering; *Permanent Secretary,* F. R. Moulton; *General Secretary,* Otis W. Caldwell; *Treasurer,* W. E. Wrather.

Executive Committee: Burton E. Livingston, *Chairman;* Roger Adams, Otis W. Caldwell, Anton J. Carlson, Arthur H. Compton, Charles F. Kettering, Kirtley F. Mather, Walter R. Miles, F. R. Moulton, Elvin C. Stakman, and W. E. Wrather.